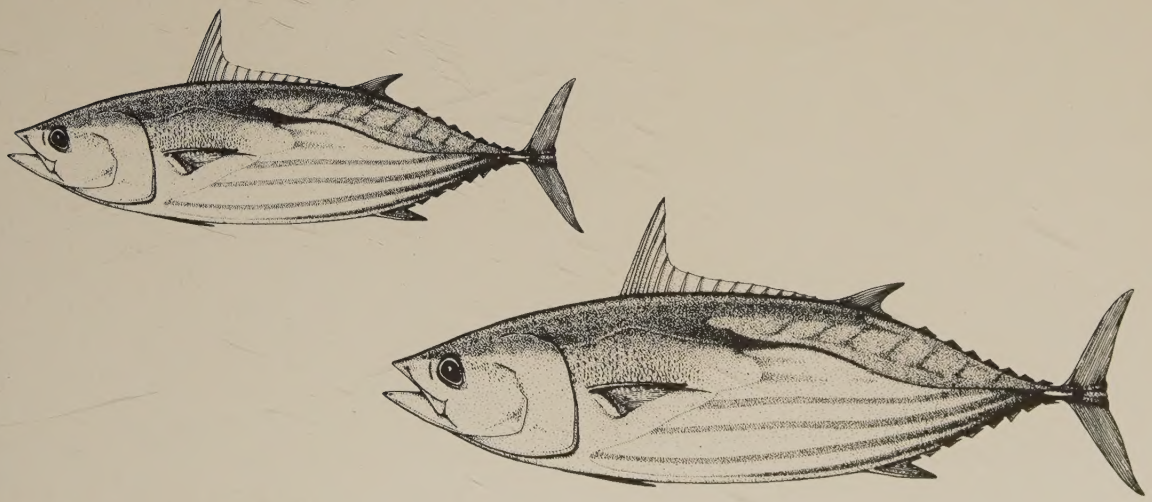
June 1974
No. 6

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



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National Oceanic and Atmospheric Administration
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SOUTHWEST FISHERIES CENTER
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LA JOLLA, CALIFORNIA 92037

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JUNE 1974, No. 6

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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L.E. Eber, Leader
Fishing Information Systems
Southwest Fisheries Center
La Jolla, California

Submitted for publication July 22, 1974

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L. Eber (Figures 4 and 6)
F. Miller (Figures 9 and 10)
J. Renner (Figures 1, 2, 3, 5, 7, 8, and 15-Day Supplement)
J.F.T. Saur (Figures 11 and 12)

TECHNICAL EDITOR:
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R. Allen

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Pacific Environmental Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by L.F. Giovando from observations by S.G. Westhaver at Langara Island Light; D.L. Kupillas at Cape St. James Light; L. Collins at Kains Island Lightstation; O.A. Edwards at Amphitrite Point Light.
Scripps Institution of Oceanography, La Jolla, California
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Expendable bathythermograph observations are made by the mates of the S.S. Hawaiian Enterprise of Matson Navigation Company. The data are processed under supervision of Dr. D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government Order NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Sea surface temperatures in June 1974 continued to be below normal along the entire west coast of North America. Cooler conditions also persisted in the Gulf of Alaska and southward to about 40°N. Negative deviations reached maximums of 2°F (1.1°C) or more in offshore areas southwest of British columbia. Negative deviations exceeding 2°F (1.1°C) also occurred off southern Oregon and northern California and in the area south of 25°N, between 120° and 130°W (Figure 5).

Surface temperatures were mostly warmer than normal south of 35°N and west of 145°W. The areas of positive deviations had diminished in size since May, reflecting a weak cooling tendency in most of the eastern North Pacific.

Barometric pressures were very close to normal in June 1974. The center of the eastern North Pacific anticyclone was found consistently at about 35°N during the month with some east-west excursion between 135° and 150°W. A high pressure ridge extending from the anticyclonic center into the Pacific Northwest coupled with the thermal low over southwest desert areas created steady north to northwest along-shore winds which maintained strong coastal upwelling.

Western North Pacific

Sea surface temperature conditions in central portions of the western North Pacific continued to be cooler than normal. Negative deviations exceeded 2°F (1.1°C) in several areas. A warming tendency was indicated south and east of Japan by positive deviations of 2°F (1.1°C) or higher (Figure 6). Prevailing winds in these areas ranged from southerly to easterly during the month.

Eastern Tropical Pacific

During May and June, temperatures in the Peru Current and its equatorial extension out to 120°W can be expected to decrease 2°-4°F (1.1°-2.2°C). Nearly all this cooling takes place south of the equator. The sea temperatures in the tropics and subtropics of the northern hemisphere continue to warm with maximum increases of 2°-4°F (1.1°-2.2°C) usually occurring in the local tuna fishing grounds south and west of Baja, California.

In June 1974 sea surface temperatures followed the seasonal trends with only minor exceptions (Figure 9). Again, as in May 1974, sea surface temperatures in the eastern tropical Pacific were as close to the long-term mean in most areas as can be expected. However, along the equator from 100°W-140°W moderate upwelling produced cold surface water between the equator and 5°S, where negative anomalies of 2°F (1.1°C) occurred in several places (Figure 10).

Lacking any shore station data from South America and with very few ship reports east of 90°W and south of the equator, it was not possible to determine whether the offshore surface temperatures in the Peru Current were near normal or slightly below normal. The surface pressure gradient index between 30°S, 90°W and the coast of Peru at 15°S was above normal throughout the month suggesting that the southeast trades were providing the needed wind stress for upwelling along the coast.

In the northern hemisphere between the equator and 5°N there were three areas of positive anomalies of 2°F (1.1°C) or greater (Figure 10). One area extended along 80°W north of Ecuador where the winds were weak and variable instead of the normal prevailing southwesterlies. The two other areas were in the vicinity

of 105°W and 135°W respectively, where light surface winds and slightly above-normal cloud cover, associated with unstable southwesterly flow into the intertropical convergence zone, decreased upwelling near the equator and produced warmer-than-normal surface waters. These conditions are generally ideal for high seas tuna fishing. Off the southern part of Baja California, temperatures increased rapidly in June under persistent light winds and near-normal cloud cover. Sea temperatures had been well below normal for many months in the fishing grounds off Baja California (local banks). The warmer sea temperatures and good fishing weather in this area has improved the bluefin fishing.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J.F.T. Saur

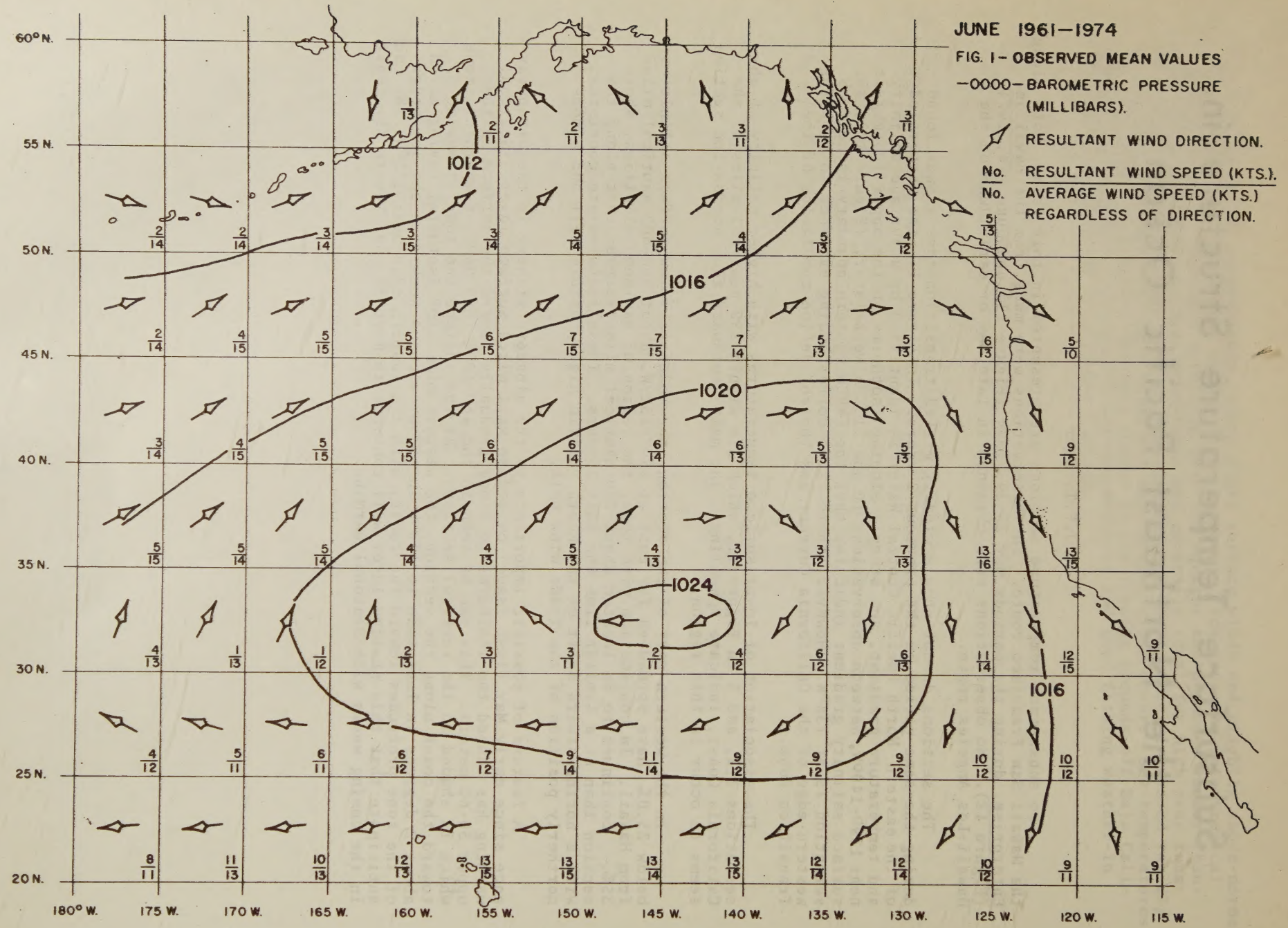
Two subsurface temperature sections are presented in this issue, both along the Hawaii-San Francisco route. The observations were made from the Hawaiian Enterprise, during the periods May 25-29, 1974 (Figure 11) and June 1-4, 1974 (Figure 12). No observations were obtained in late May or early June on the Hawaii-Los Angeles route.

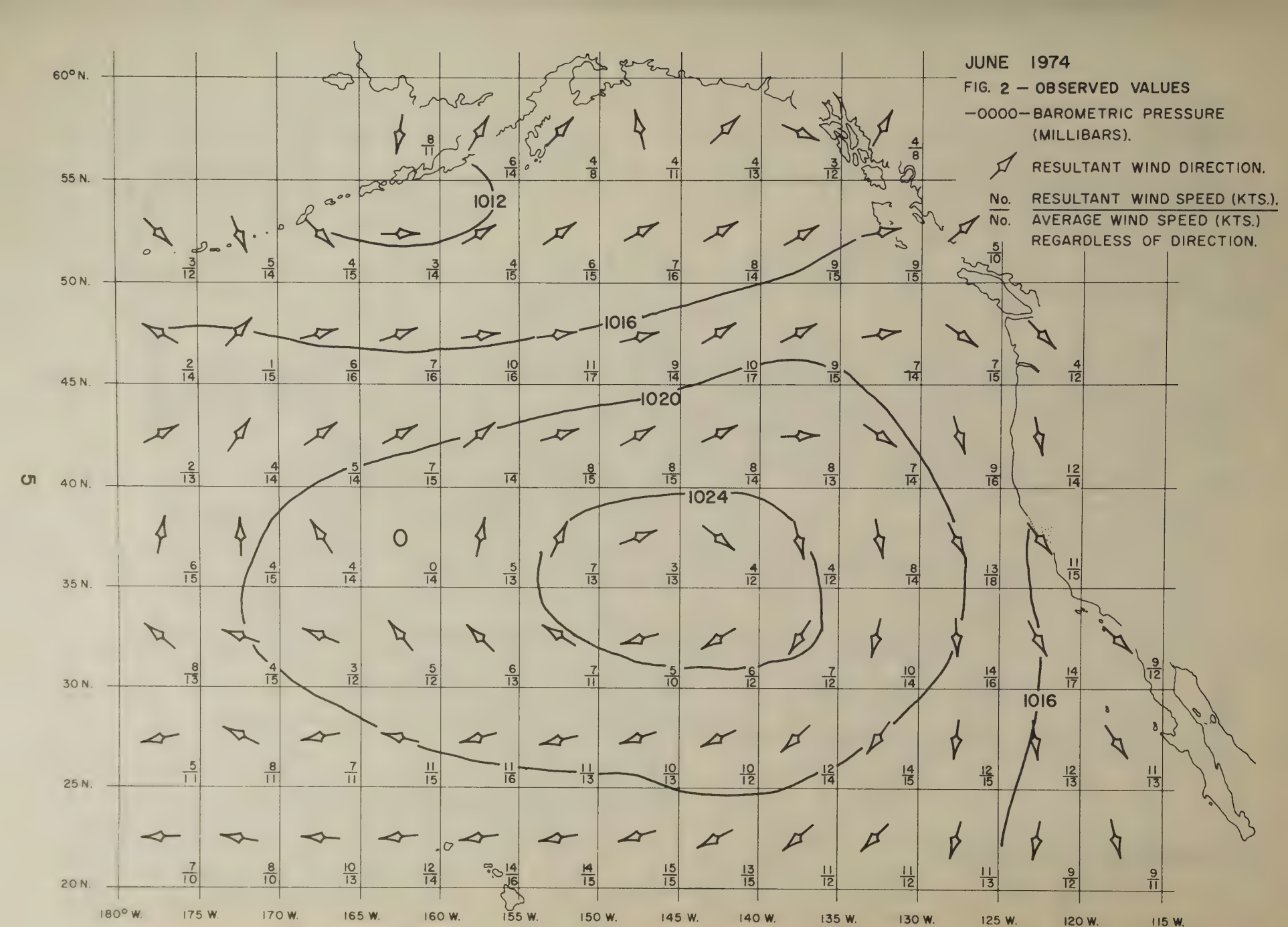
The sections do not show a clearly marked transition zone as was found during the same period in the previous 2 years. In Figure 11, the eastern edge of the eastern North Pacific Central Water is identified by a surface salinity and temperature gradient, and steeply sloping isotherms in the upper 100 meters near 139°-140°W, between observations 10 and 11. A week later, (Figure 12), the surface salinity gradient indicates that the ENPCW eastern boundary is near observation 15 at 138°W. However, there is no corresponding evidence to mark the western edge of the California Current and thereby define the limits of the Transition Zone.

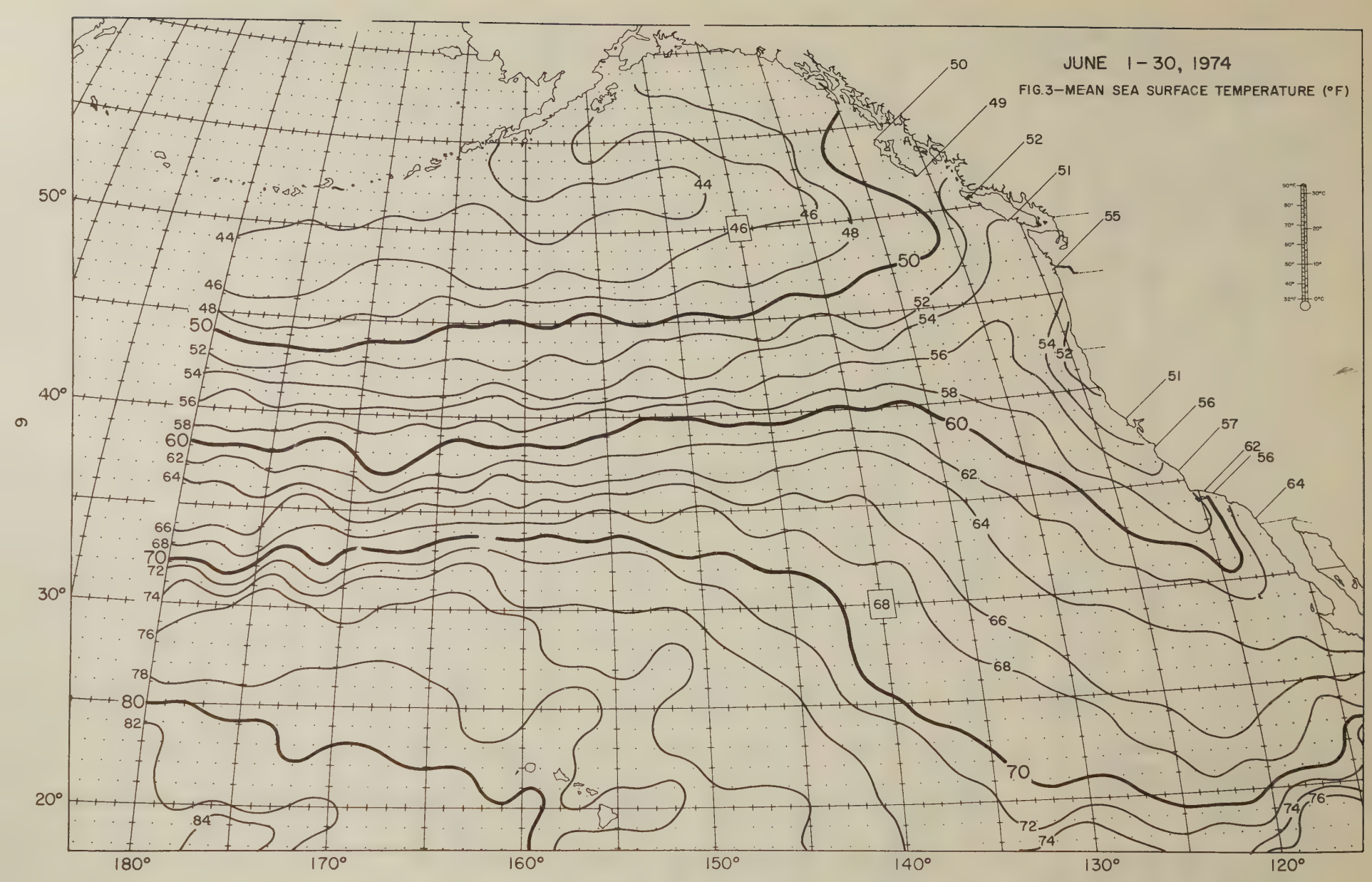
The association of lower surface temperatures with higher salinity at observations 1,2, and 3 in Figure 11, which lie within 250 nautical miles of the California Coast, indicate upwelling. The main southward flow across the section seems to occur in this region.

In the western part of the section, the moderately low surface salinities below 35.0‰ have spread as far east at 150°-152°W, about 500-600 nautical miles from Hawaii. In conjunction with this, the region of maximum salinities, above 35‰, continues to be located about 200 nautical miles farther east along the section than at a similar time the past 2 years. These features are consistent with a northeastward shift of the North Pacific high pressure cell and a more northerly position of the trade wind belt.

A feature of possible importance to the albacore fishery is the disappearance since early May (last issue) of a deep well-mixed surface layer. Seasonal warming has caused the isotherms to slope gradually toward the surface in the upper 30-60 meters. This can be seen in the 16°-19°C (61°-66°F) temperature zone, which is shaded in the vertical sections. At the surface the zone is moving toward the coast along the section, the western edge (19° isotherm) having moved about 2 degrees in longitude to 140°W in the previous 4 weeks. A shallow wedge of the zone protrudes toward the coast, with the eastern edge near 133°W. We can anticipate that this shallow layer will continue to move farther toward the coast in the coming weeks with seasonal warming.

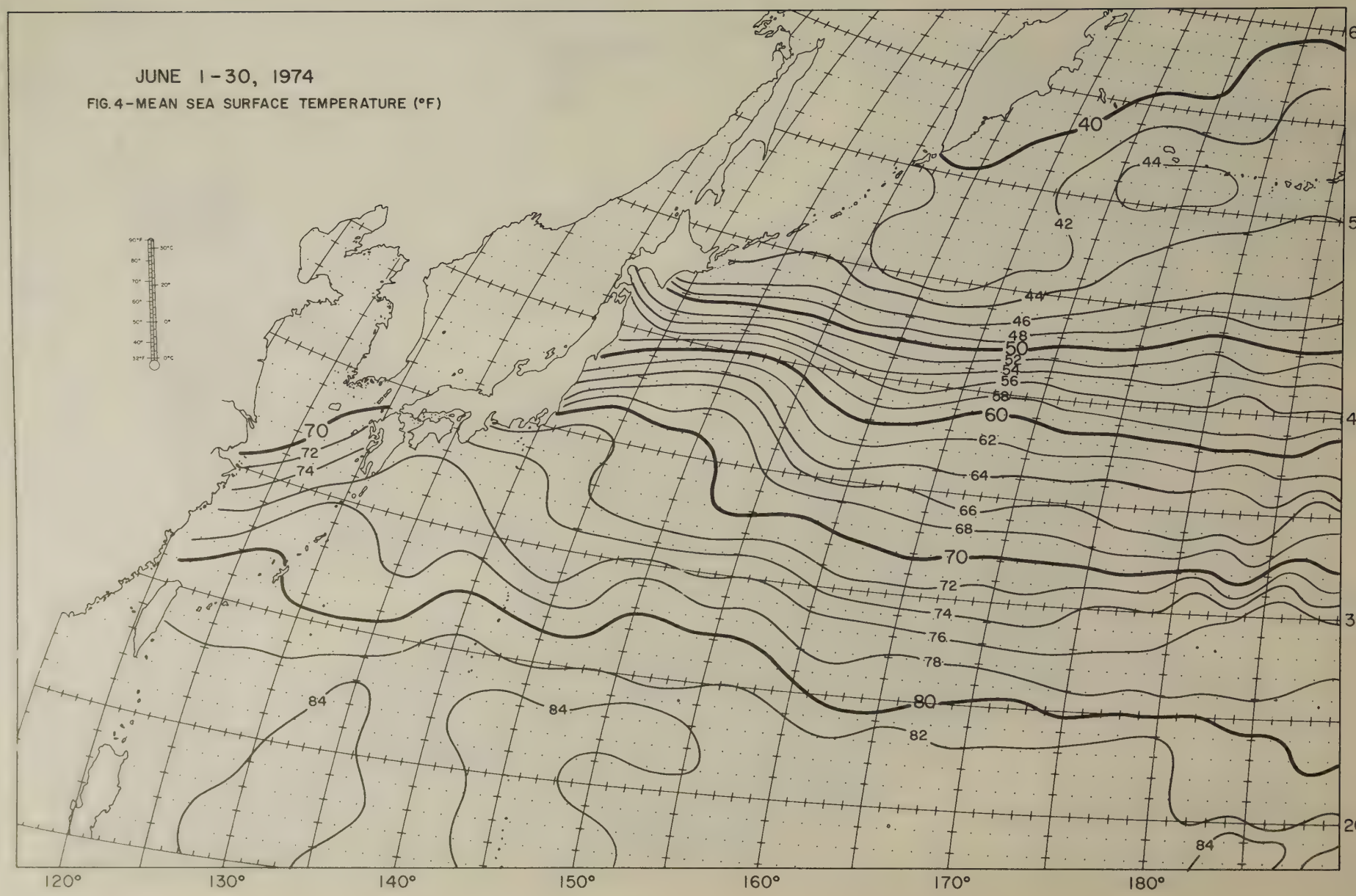

JUNE 1961–1974
FIG. 1 – OBSERVED MEAN VALUES
–0000– BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

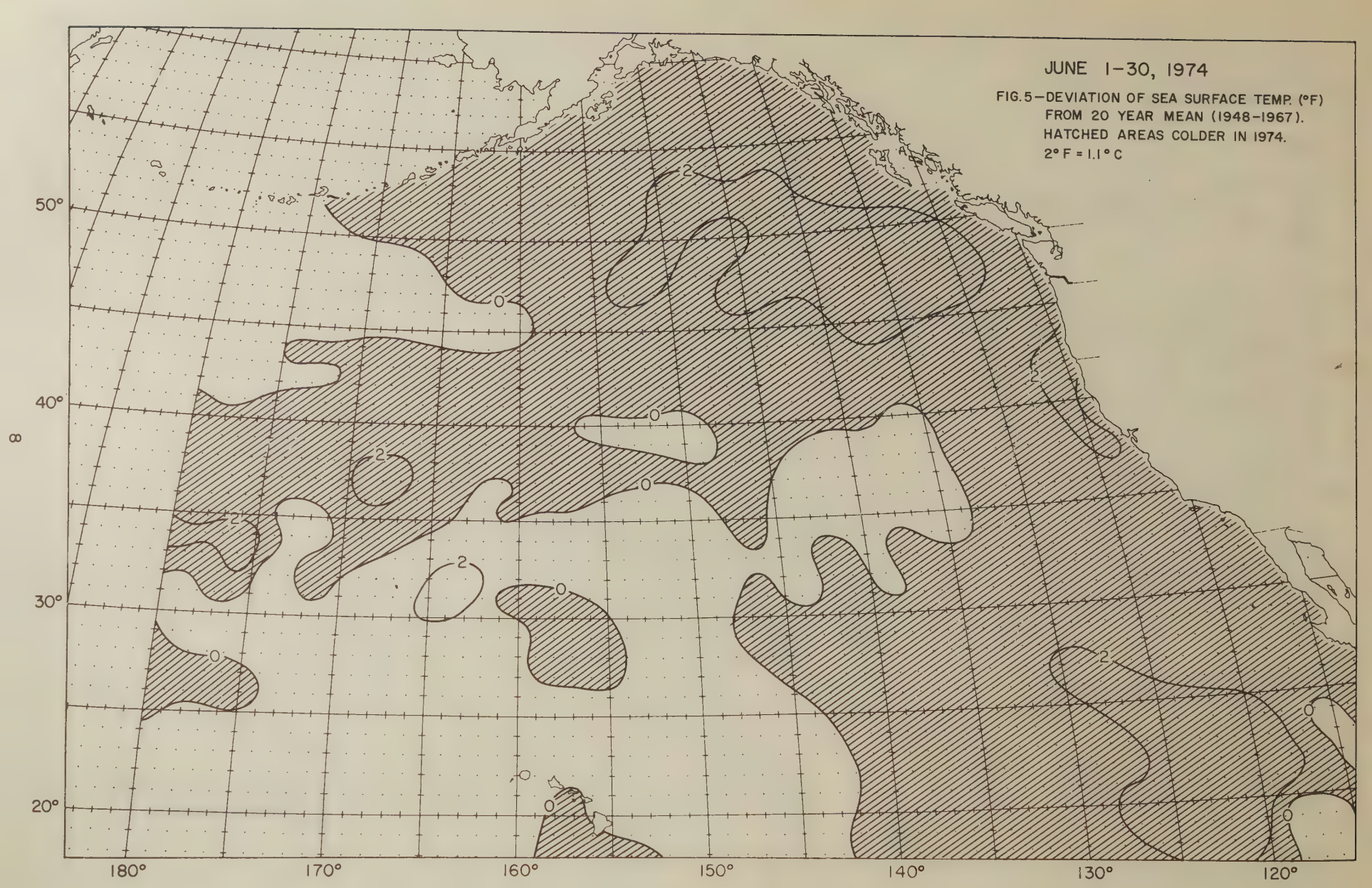

JUNE 1974
FIG. 2 — OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

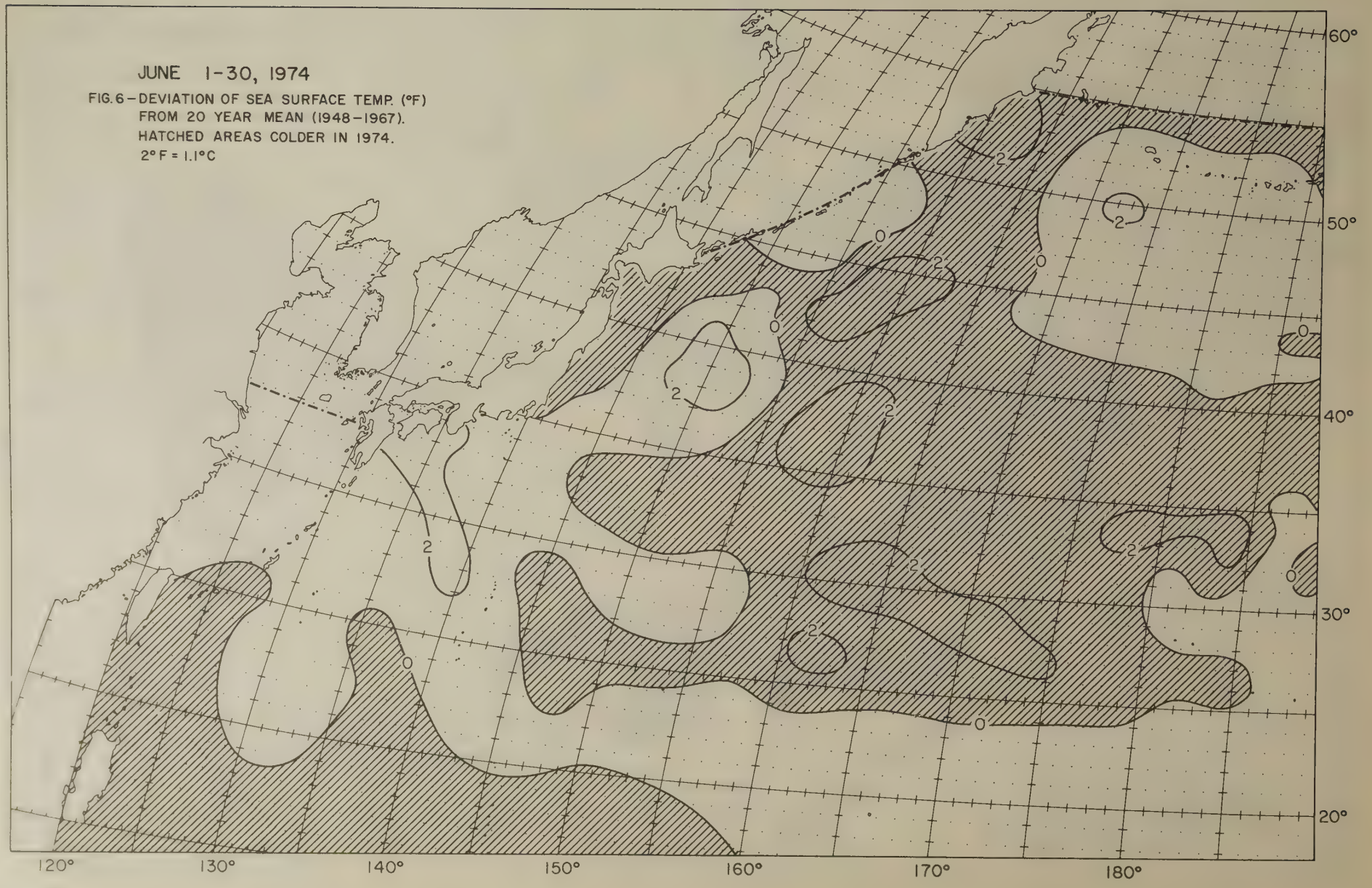

JUNE 1-30, 1974
FIG.3—MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

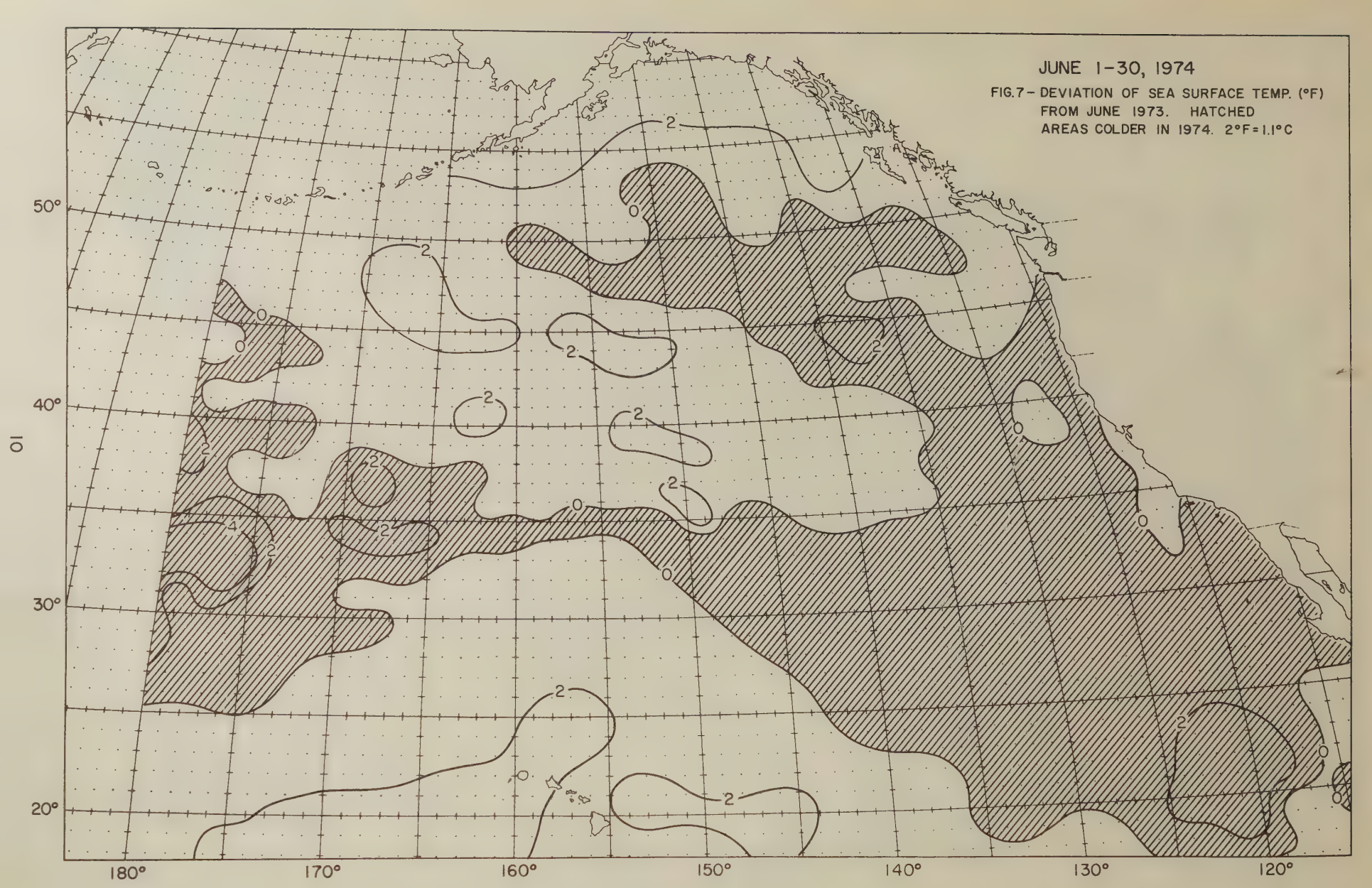
JUNE 1-30, 1974

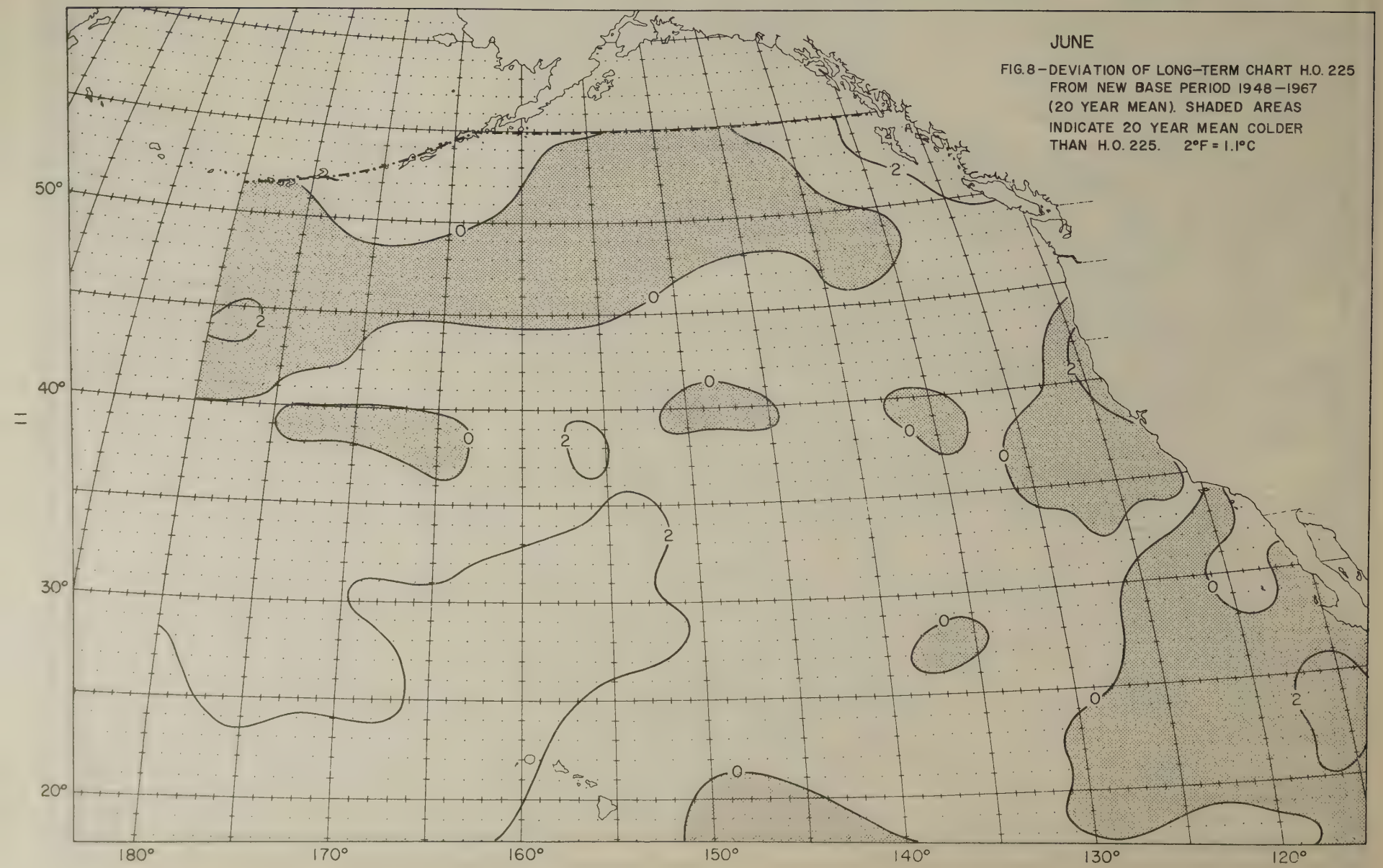
FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F)

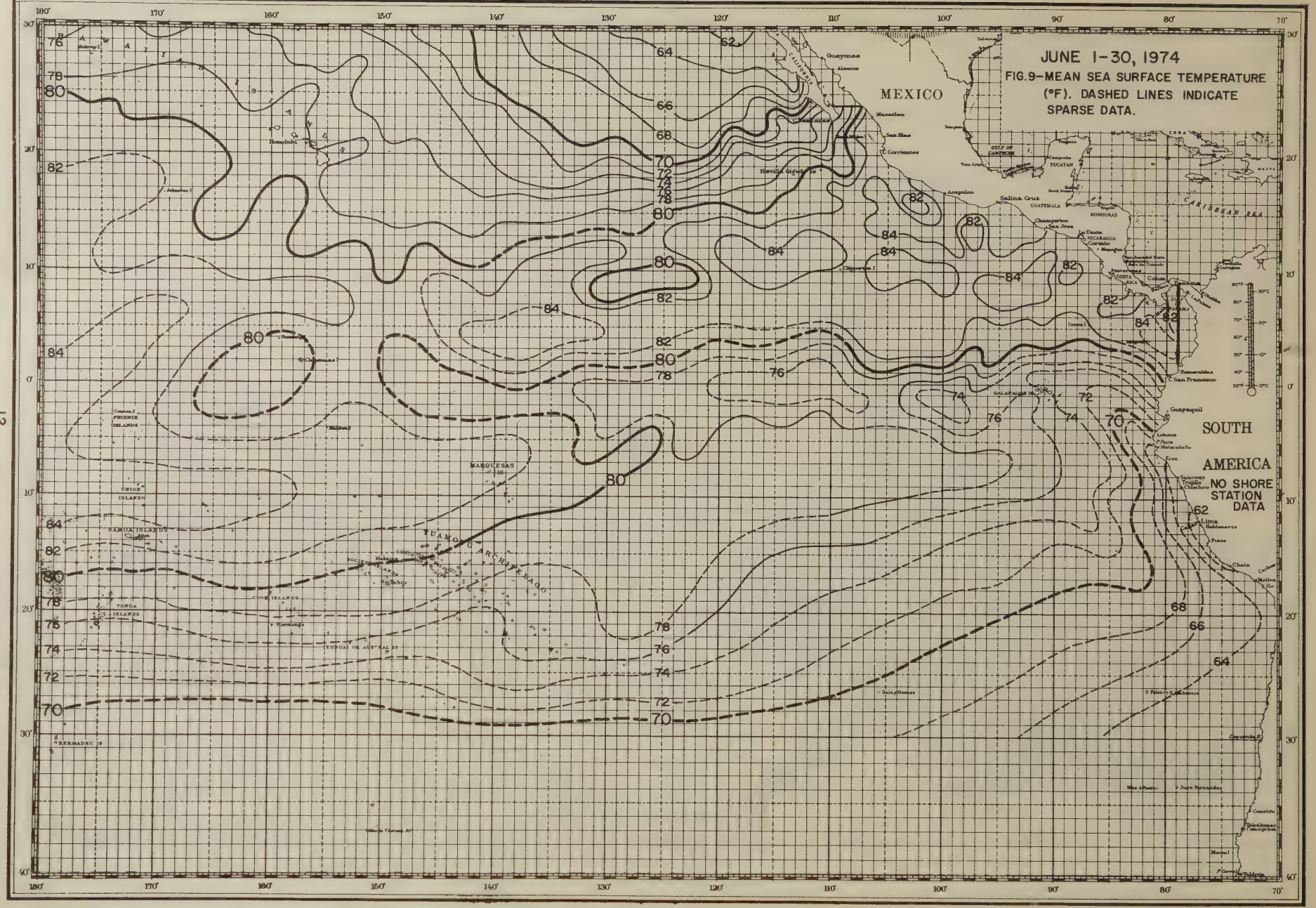



JUNE 1-30, 1974
FIG. 5—DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1974. 2° F = 1.1° C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
2
0


JUNE 1-30, 1974
FIG. 6 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948–1967). HATCHED AREAS COLDER IN 1974.
2° F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2


JUNE 1-30, 1974
FIG.7- DEVIATION OF SEA SURFACE TEMP. (°F) FROM JUNE 1973. HATCHED AREAS COLDER IN 1974. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
10


JUNE
FIG. 8 – DEVIATION OF LONG-TERM CHART H.O. 225 FROM NEW BASE PERIOD 1948–1967 (20 YEAR MEAN). SHADED AREAS INDICATE 20 YEAR MEAN COLDER THAN H.O. 225. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


JUNE 1-30, 1974
FIG.9-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
NO SHORE STATION DATA
HAWAIIAN ISLANDS
TUAMOTU ARCHIPELAGO
MARQUESAS
SAMOA ISLANDS
TONGA ISLANDS
COOK ISLANDS
PHOENIX ISLANDS
UNION ISLANDS
KERMADEC IS
CARIBBEAN SEA
GULF OF CALIFORNIA
GALAPAGOS IS.
Honolulu
Acapulco
Salina Cruz
Guayaquil
Callao
Lima
Arica
Valparaiso
Antofagasta
Iquique
Tahiti
Rarotonga
Pago Pago
Easter I.
Juan Fernandez

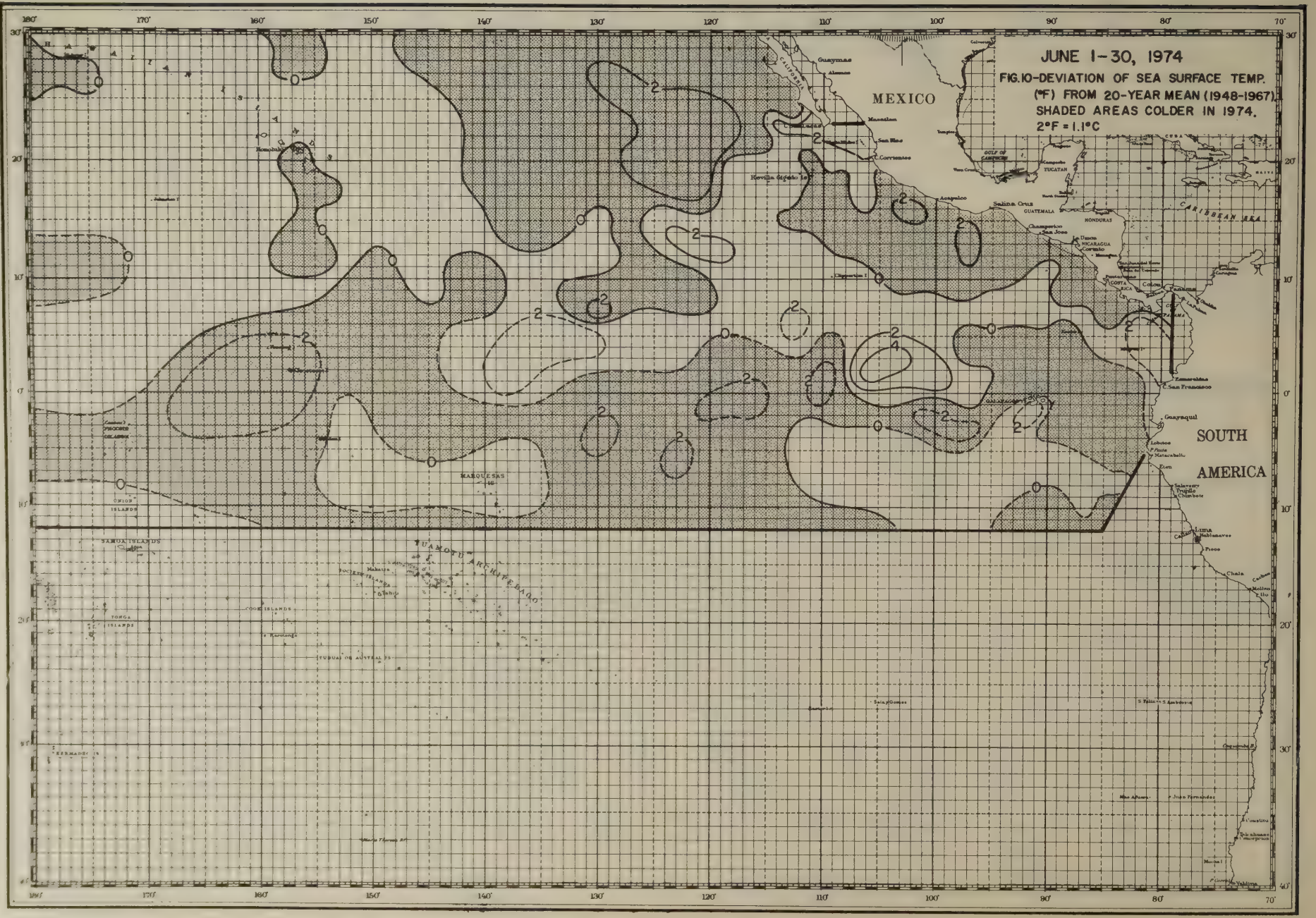
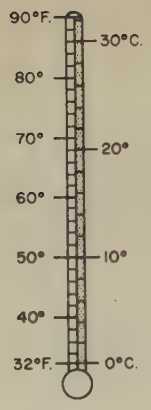

JUNE 1-30, 1974
FIG.10-DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1974.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
CUBA
HAITI
TUCATAN
GULF OF CALIFORNIA
Guaymas
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Champerico
San Jose
Corinto
Balboa
Colon
Cartagena
Maracaibo
Puerto Cabello
La Guaira
Caracas
Barcelona
Trinidad
Esmeraldas
San Francisco
Guayaquil
Salaverry
Trujillo
Chimbote
Callao
Lima
Huacho
Pisco
Chala
Matarani
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Juan Fernandez
Mas Afuera
Mas Atierra
Easter I.
Pitcairn I.
Henderson I.
Ducie I.
Oeno I.
Marquesas
Tuamotu Archipelago
Society Islands
Tahiti
Samoa Islands
Cook Islands
Tonga Islands
Tubuai (Austral Is.)
Rapa
Salas y Gomez
Sala y Gomez
Galapagos Is.
Cocos I.
Malpelo I.
Gorgona I.
Gorgona
Gallo I.
Tumaco
Buenaventura
Malpelo
Gallo
Tumaco
Bermuda Is.
Hawaiian Is.
Honolulu
Kingman Reef
Palmyra I.
Christmas I.
Fanning I.
Line Is.
Phoenix Is.
Howland I.
Baker I.
Jarvis I.
Canton I.
Enderbury I.
Tokelau Is.
Union Is.
Ellice Is.
Gilbert Is.
Nauru I.
Ocean I.
Marshall Is.
Wake I.
Johnston I.
Solander I.
Yakutat
Juneau
Sitka
Ketchikan
Prince Rupert
Vancouver
Victoria
Seattle
Portland
Astoria
Eureka
San Francisco
Monterey
Point Conception
San Diego
Los Angeles
Santa Barbara
Ensenada
Guadalupe I.
Cedros I.
Isla Natividad
Isla Asuncion
Isla Cedros
Isla Magdalena
Isla Margarita
Isla Tiburon
Isla Angel de la Guarda
Isla Partida
Isla Carmen
Isla Coronados
Isla Santa Rosalia
Isla Santa Catalina
Isla Cerralvo
Isla Espiritu Santo
Isla Santa Cruz
Isla Tres Marias
Isla Socorro
Isla Clarion
Isla Guadalupe
Isla Revillagigedo
Isla Roca Partida

FIGURE 11.



HONOLULU – SAN FRANCISCO

MAY 25–29, 1974

SS HAWAIIAN ENTERPRISE

VOYAGE 91

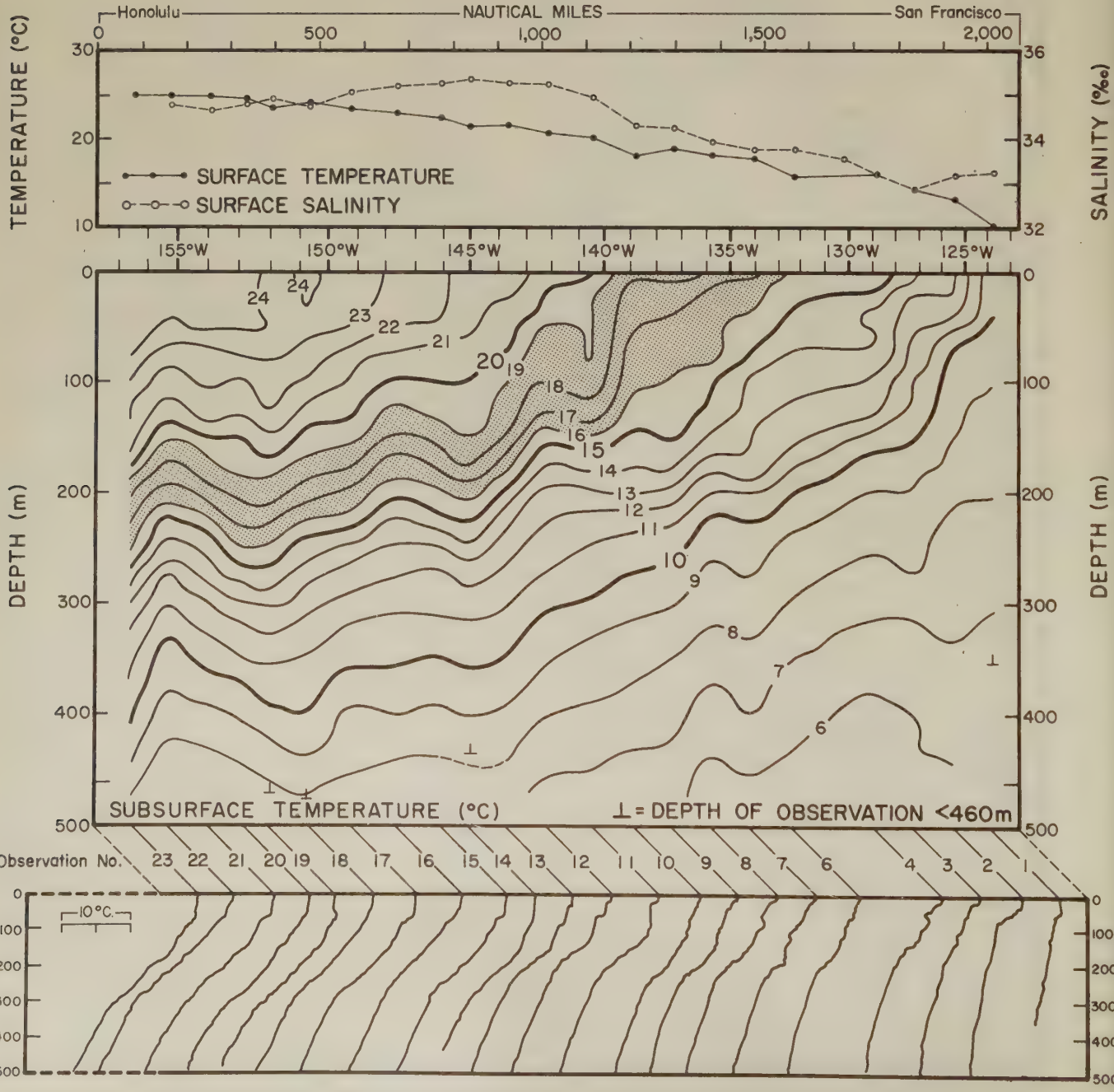
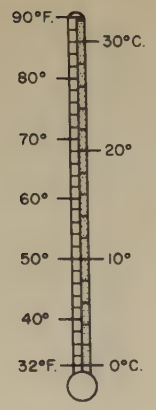


FIGURE 12

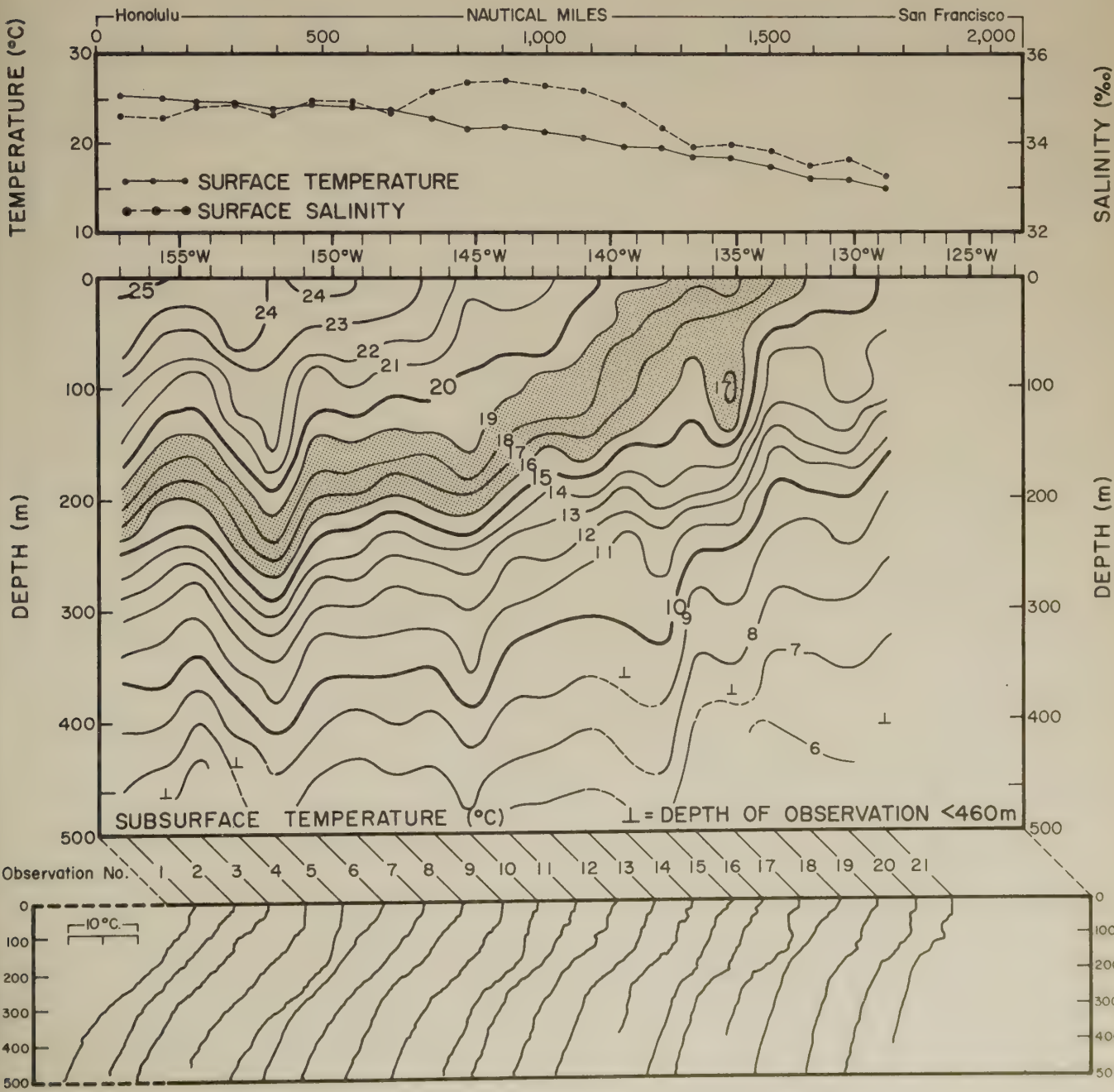


HONOLULU – SAN FRANCISCO

JUNE 1-4, 1974

SS HAWAIIAN ENTERPRISE

VOYAGE 91



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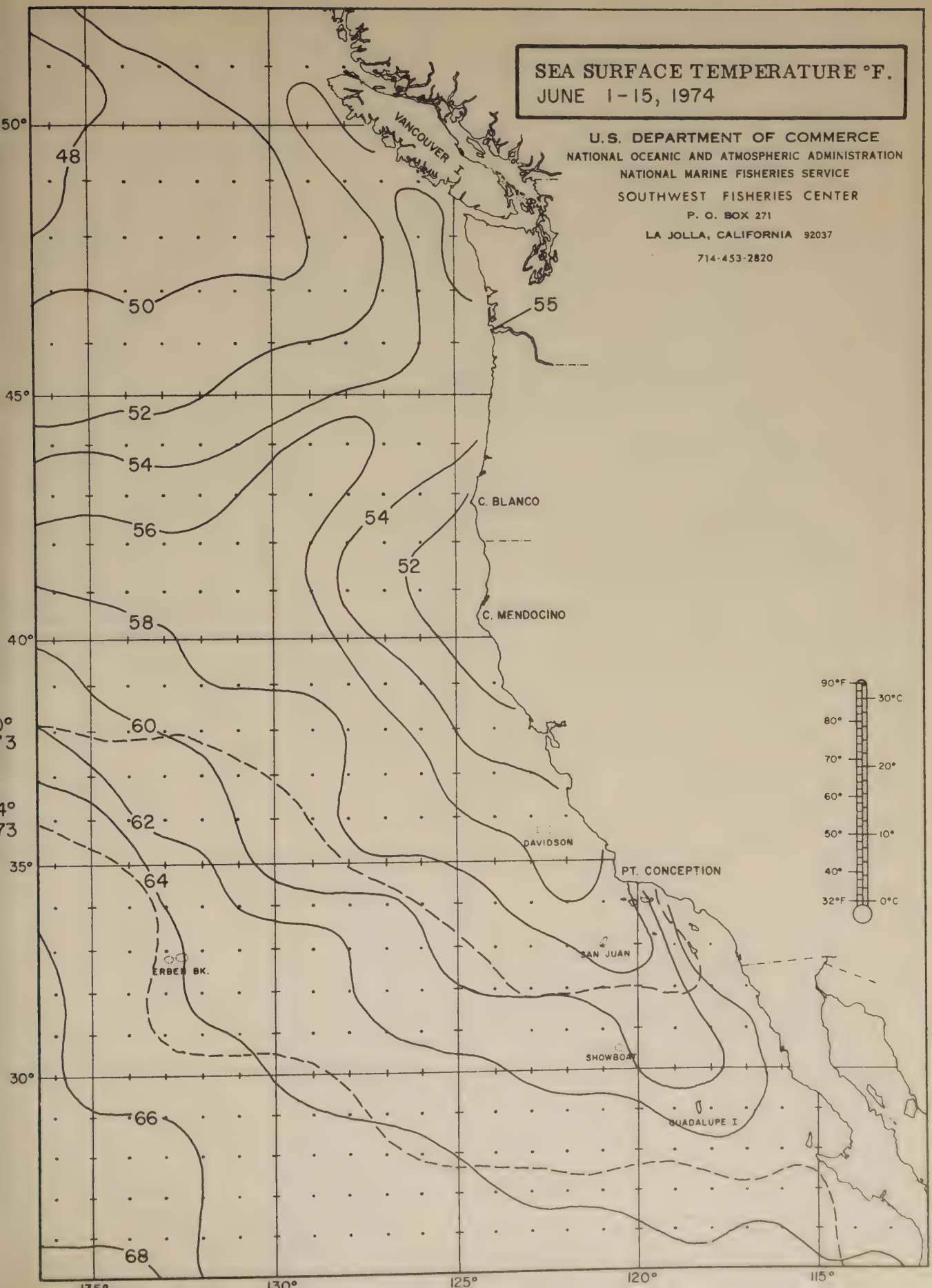

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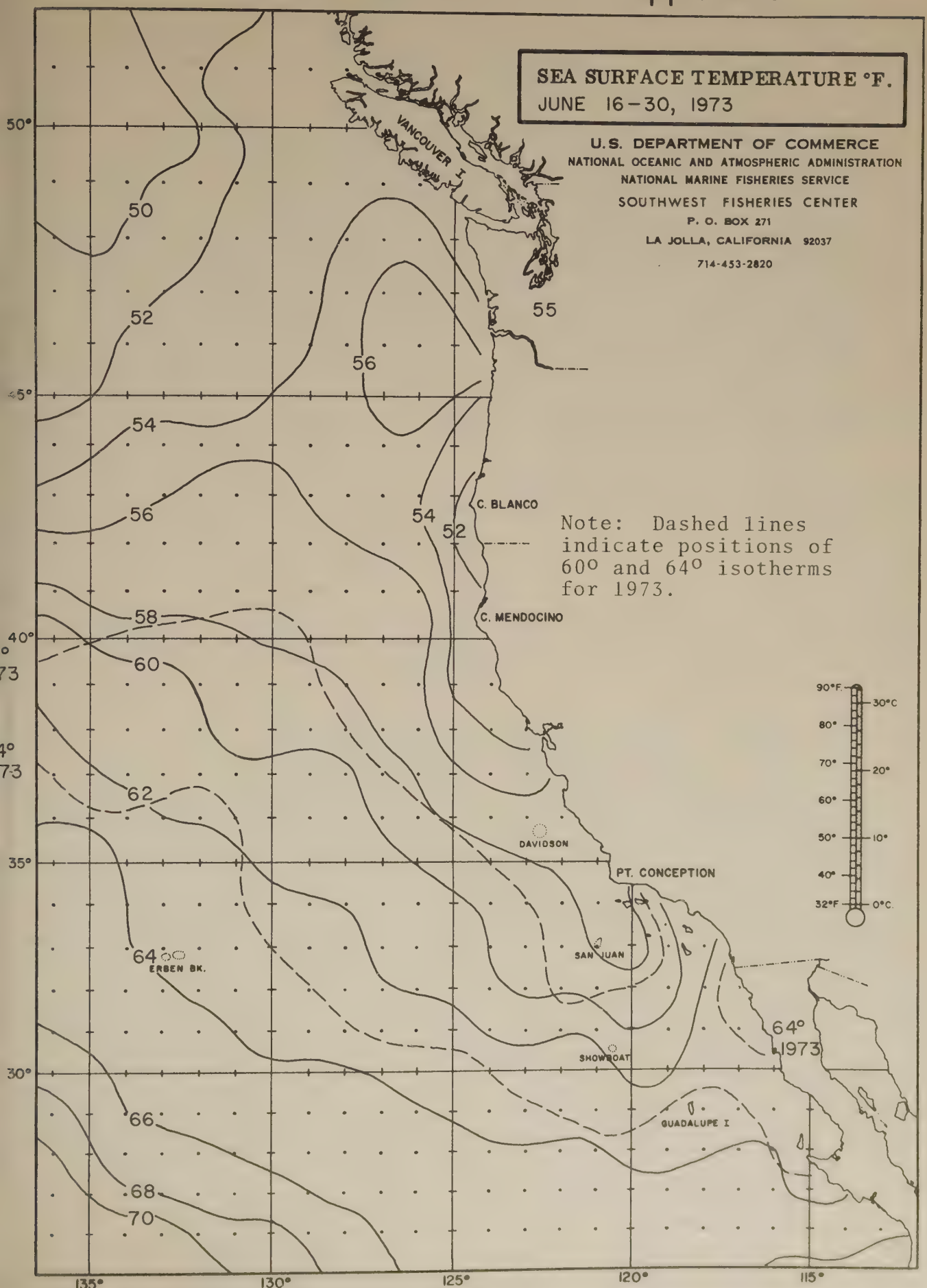


UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

BULLETIN No. 74-1

ALBACORE FISHERY EXPECTED TO BE CENTERED NORTH, BUT OUTLOOK OFF CALIFORNIA IMPROVED, FIRST CATCHES of 1974 SEASON TAKEN IN OFFSHORE WATERS

It appears that during the 1974 Pacific West Coast albacore tuna fishery that approximately 60% of the catch will be taken n waters north of San Francisco and 40% in waters to the south. Catches off California are expected to improve this year over 1973 when the catch was divided about 80% north of San Francisco and 20% south with most of the catch coming from waters off he Pacific Northwest. If 1974 is like an "average" year, a total of 20,050 to 30,350 tons of fish could be expected to be landed. This estimate of landings is based on the mean and standard deviation 25,200 and 5, 150 tons, respectively, of West Coast albacore catches for the period 1964-1973. The increase in fleet capacity that has occurred in recent years and the possibility of an early t rt of the fishery this year could boost the 1974 catch above the "average." An accurate pre-season prediction of how much ish will be caught during the 1974 season is difficult to make because of insufficient knowledge concerning the population dynamics of the North Pacific albacore and fish-ocean relationships.

The forecast of the general distribution of the albacore fishery is based on predictive indices developed at the National Marine Fisheries Service La Jolla Laboratory which relate north-south geographic variations in the fishery with oceanographic nd meteorological conditions during spring months in certain offshore waters through which albacore migrate in their travel to waters off North America.

The outlook for albacore sportsfishing off southern California is good, based on offshore scouting reports.

The NMFS La Jolla Laboratory and the American Fishermen's Research Foundation this year are again conducting cooperative albacore tuna field studies. The purposes of the cooperative studies are to investigate the shoreward migration of albacore tuna into the North American west coast fishery and the associated marine environmental factors that influence this migration, and to study the early-season and within-season distribution of albacore in the offshore and nearshore regions. These studies are designed to improve our knowledge of factors affecting the onset and subsequent development of the fishery, to examine the possibilities for fishermen to extend the fishery farther offshore, to start the fishery earlier than is usual, and to better "stay on fish" during the season.

Research operations are being conducted by five commercial fishing vessels on charter to AFRF and by the NMFS research vessel David Starr Jordan and will include oceanography, fishery biology, fish tagging and fish scouting. In addition, three commercial fishing vessels on charter to AFRF will operate during the fishing season to evaluate the availability of fish in areas other than where the main portions of the fleet are operating. NMFS technicians will be placed on these boats to assist in making oceanographic observations and tagging fish.

The first reported albacore catches of the 1974 season, nine fish of mixed size, were made during the third week of May about 1000 miles west of Point Conception by a jigboat operating out of Seattle. Subsequently, catches of up to 105 fish per day have been reported by this vessel in an area about 1200 miles west of San Diego.

The five jigboats on charter to AFRF, which departed San Diego on May 26, sailed southwest scouting the region to Guadalupe Island and then northwest to the vicinity of Erben Bank. They then separated on May 31 into two groups of two and three boats to continue scouting and fish tagging operations in waters farther offshore. On June 4 the charter vessels began working with the Jordan northward along longitude 138°W.

The first catches, six fish of mixed size, were made by the vessels on charter to the AFRF on May 29 about 500 miles west-southwest of San Diego in waters with sea surface temperatures (SST) of 62.5° to 63.5°F (17.0° to 17.5°C). Between May 30 and June 1, as the charter boats fished between about 720 to 750 miles west-southwest of San Diego, most of the vessels made small catches with a high catch of 51 fish per day. Catches improved markedly on June 2 when two of the charter vessels caught 115 and 114 fish and the other three boats from 31 to 70 fish while trolling in an area 850 to 950 miles west-southwest of San Diego. Good catches of 148 and 262 fish continued on June 3 for two of the boats operating in 66°F water, while catches declined for the three boats working slightly southward in 67°F water. On June 4 and 5 catches by the chartered vessels ranged from 1-58 fish as they moved northward to the area about 900 miles west of Point Conception.

Fish caught inside of Erben Bank have been of mixed size ranging from about 4 to 30 pounds with 6 to 12 pound fish predominating. Catches made between about 700 to 950 miles offshore have been mostly small fish averaging about 5 pounds. Catches made farther offshore have been generally on larger fish ranging from 6 to 20 pounds with 12 to 20 pound fish predominating.

Several independent commercial jigboats are fishing in the offshore waters, and many more large jigboats are enroute or are planning to leave soon. A high catch of 500 fish, averaging about 12 pounds, was made on June 4 by one of the independent vessels about 900 miles west of Point Conception. Catches in this area on June 5 by independent vessels were between 100-270 fish weighing mainly 12-20 pounds.

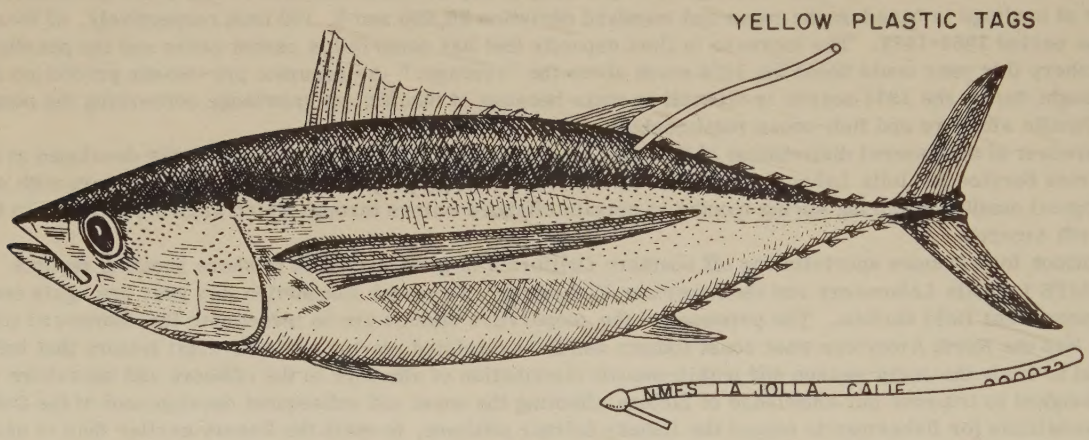
FISHERMEN ARE REQUESTED TO WATCH FOR TAGGED FISH. Please see poster on the back page concerning rewards paid for tag returns and what to do when a tagged fish is caught.

Staff, Albacore Fishery Investigations
R. Michael Laurs, Leader

June 6, 1974

$ REWARD $

FOR ALBACORE TUNA TAGS



THE
NATIONAL MARINE FISHERIES SERVICE WILL PAY $ 2.00 FOR EACH TAG RETURNED (SOME FISH HAVE MORE THAN ONE TAG).

WRITE:

- WHERE
- WHEN
- HOW

▶ FISH WAS CAUGHT

- LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)

FORWARD TO NMFS ADDRESS ON TAG, TO AFRF 4904 N. HARBOR DRIVE, SAN DIEGO, CALIF., OR STATE FISHERIES AGENCIES.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

BULLETIN No. 74-2

ALBACORE FISHING CONTINUES IN OFFSHORE WATERS

Albacore tuna catches continued to be made in offshore waters during the past week and one-half, with the area of best shing gradually shifting shoreward. At the end of the first week in June, best fishing was centered at about 800 miles west of orro Bay, and by the end of the second week it had shifted to about 600 miles west of Morro Bay. Scattered catches were reorted from offshore waters in a broad region between 220-1200 miles off the coast and between San Diego and Cape Mendocino. fleet of approximately 25 jigboats is fishing in offshore waters. In addition, five jigboats on charter to the American Fishermen's Research Foundation and working cooperatively with the NMFS R/V David Starr Jordan are conducting fishing, fish tagging nd oceanographic operations.

Best catches, up to 315 per day with most boats catching 90-200 fish per day, were made during June 11-14 at approximately 600-650 miles off Morro Bay. The majority of these fish weighed from 10-14 pounds and were caught in waters having ea surface temperatures of 62-64° F. In general, fishing on most other days has been spotty with catches up to about 50 fish er day with some boats occasionally making catches over 100 fish per day. However, catches appeared to be improving on une 17 when several boats reported catching about 100 fish per day with a high score of 160 fish about 600 miles off Morro Bay.

The jigboats on charter to AFRF have been fishing in two groups. One group worked between 34°00' to 36°20'N, 132-139° V in 61.0-67° F (16.1-19.4°C), but their catches were generally below 100 fish/day/boat until June 13 when they entered the icinity off Morro Bay where the independent boats were getting good scores. A considerable number of fish were tagged in this rea.

The second group of AFRF charter vessels fished between 32-36°N, 131°50'-138°W in 61.5-65°F (16.4-18.3°C) waters. heir best day was on June 7 near 35°N, 137°W when two boats had scores of 244 and 289 fish while fishing in 64°F(17.8°C) aters. Catches for all other days, except by one boat on June 15, have been slightly below 100 fish/day/boat.

Catches by all the chartered boats have been on mixed-size fish with many 5 and 12 pound fish being caught. As of June 7, 4422 fish have been caught and 682 have been tagged by these boats.

The Jordan conducted oceanographic work and fish scouting to 41°N latitude along 137°30' and 139°W longitude, but found ew fish north of 36°N latitude. The Jordan is now moving southward.

Prevailing weather conditions during the first two weeks of June allowed seasonal warming to occur in most areas offhore western North America, except for one region southwest of Vancouver Island and another between Cape Blanco and Point renas where temperatures cooled by as much as 2°F from those during the last half of May. The most pronounced warming ccurred in an offshore area between 35-45°N and 128-136°W where sea surface temperatures rose 2-4°F from values during he previous 2-week period. Above-normal warming also occurred offshore southern California and northern Baja California out o about 300 miles where temperatures also increased by 2-4°F.

As a result of these changes, sea surface temperatures are 1-2°F below normal along most of the North American coast, xcept for a 60-100 miles band of slightly-above-normal temperatures that extend from Point Sur southward along southern and Baja California. Above-normal temperatures of 1-2°F also exist in an offshore area between 32-43°N and west of 130°W longiude.

According to information supplied by the Long-Range Prediction Group of the National Weather Service, temperatures ver interior regions of the western U.S. are expected to be above normal from mid-June through mid-July. These conditions, oupled with the normal development of high pressures offshore, should cause frequent periods of strong north-northwesterly inds off the U.S. west coast. Although these conditions are favorable for creating thermal fronts along the coast, fishing fforts may be hampered by strong winds and rough seas.

Staff, Albacore Fishery Investigations
R. Michael Laurs, Leader

une 18, 1974